

(19)

Eur päisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 0 738 991 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
23.10.1996 Bulletin 1996/43

(51) Int Cl.⁶: **G07F 17/32**

(21) Application number: **96302643.0**

(22) Date of filing: **16.04.1996**

(84) Designated Contracting States:
DE ES IT NL

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(30) Priority: **18.04.1995 GB 9507843**

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(54) Display panel for entertainment machines

(57) A credit-operated entertainment machine, such as a random-selection fruit machine, has a housing (1) containing the main control system (23,24), and a display panel (9) through which electrical display devices (15, 16) can be seen. The machine is made in modular form and the display panel (9) can be removed and re-

placed with a different display panel (9) to enable the game to be played to be changed without requiring replacement of the entire machine. The display panel (9) may incorporate display devices in the form of lamps (15) and also rotatable reels (16) which are removable and replaceable with the panel (9).

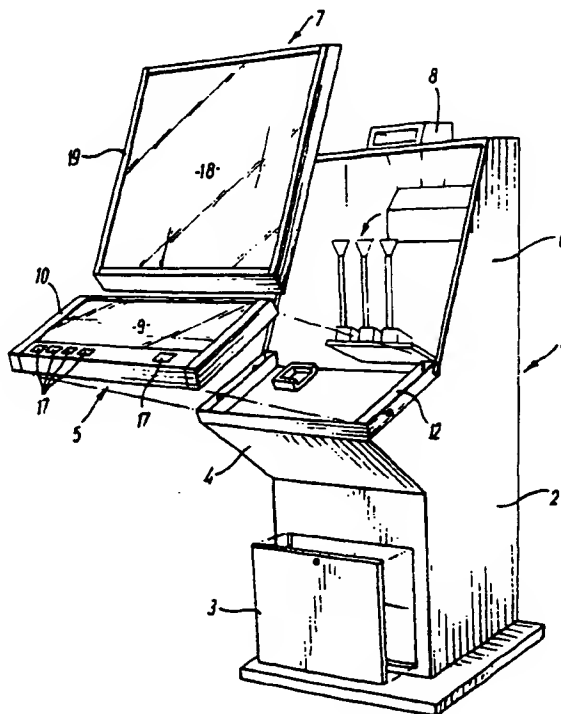


FIG. 1

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Description

This invention relates to credit-operated entertainment machines. The term credit-operated covers operation by coin or token or credit card or any other means of establishing credit or monetary value.

The invention is particularly, although not exclusively concerned with a credit-operated entertainment machine of the fruit machine kind with which three or four symbol-bearing reels are rotated about a common horizontal axis to select on a random (or pseudo random) basis a combination of symbols which is displayed to the player on a win line through a window.

With one kind of fruit machine, a main game is played with the symbol-bearing reels and it is then possible to play a supplementary game which may involve progression along a trail by back-illumination of successive trail zones. Progression may be determined by a rotatable number-bearing supplementary reel visible through a window. It is also usual for there to be game-enhancing features such as a gamble trail which again has zones which can be back illuminated.

With this known arrangement the machine commonly has a box construction housing with upper and lower front glass display panels which are screen printed to define the windows, the back-illuminated zones of the supplementary game and features, and usually various decoration and information displays which may also be back illuminated.

New fruit machine models may be introduced at frequent intervals, say every few months and this requires transportation of machines: the new model is delivered to selected sites and existing machines are removed to other sites. Having regard to the significant size and weight of the machines this requirement for frequent transportation involves appreciable inconvenience and cost:

Manufacture of a new fruit machine model involves designing new artwork for the printed glass panels. The panels can then be mounted on a standardised housing, and a standardised microprocessor-based control system can be adapted to the new model by introduction of appropriately programmed chips or modules. However, in practice a limitation is imposed on further standardisation by the need to make physical changes to the reels (to accommodate different symbol sequences), and to the back-illumination lamps (to accommodate changes in the zones to be illuminated). It is usual for the reels and lamps to be installed within the housing using wiring specially arranged for the particular machine model. As a sequence of this, the panel, reels and lamps, are assembled as an essentially permanent purpose-built part of the housing.

Also, it is usual for the wiring to involve multiple individual connection between the control system and the reels and lamps as also with the other electrical equipment such as user controls (eg press buttons), coin mechanism, pay out mechanism etc. which can be in-

convenient and costly to manufacture.

One object of the present invention is to provide an improved wiring system for a credit-operated entertainment machine.

A further object of the present invention is to improve and extend the manufacturing standardisation of a credit-operated entertainment machine.

A yet further object is to facilitate introduction of new machine models at different sites.

According to one aspect of the present invention therefore there is provided a credit-operated entertainment machine system comprising a housing containing control equipment, at least one display panel mountable on the housing, and electrical display devices co-operable with the panel to provide a display therewith,

characterised by the provision of at least one further display panel interchangeable with the first said panel, said panels being removably mountable on the housing in said cooperation with said devices.

With this arrangement, due to the provision of interchangeable removably mounted panels which are mountable in cooperation with the electrical devices, there are enhanced possibilities for standardisation which can permit construction of a modular machine which can be converted to a new model by replacement of the panel and without requiring replacement of the housing. The panel can be mounted without requiring purpose-built interconnections with the housing.

The panels may be mountable in cooperation with the electrical devices as a consequence of a predetermined interrelationship between the panels and one or more electrical devices mounted in the housing. Alternatively, or additionally one or more electrical display devices may be mounted on the panels so as to be removable with the panel. Alternatively or additionally one or more other electrical devices such as user controls may be mounted on the panels.

Thus, and in accordance with a second aspect of the present invention there is provided a credit-operated entertainment machine comprising a housing containing control equipment, at least one display panel mountable on the housing, and electrical display devices co-operable with the panel to provide a display therewith, characterised in that the panel is removably mountable on the housing and at least one electrical device is mounted relative to the panel so as to be removable therewith.

The panel may also incorporate other electrical devices such as user controls, as well as the display devices.

With the first and second aspects of the invention the panel is preferably supported on the housing by means of a frame structure so that the panel can be removed and mounted as a module together with this structure.

Thus, and in accordance with a third aspect of the present invention, there is provided a credit-operated entertainment machine comprising a housing contain-

ing control equipment, at least one display panel mountable on the housing, and electrical display devices co-operable with the panel to provide a display therewith,

characterised in that the panel is provided with a supporting structure and the panel is removably mountable on the housing as a module together with the frame structure.

The frame structure may be mountable on the housing by a sliding connection or by using a separable or lift off hinge or any other suitable mechanism. The structure may be lockable in position for security reasons.

With the aspects of the invention described above, in order to facilitate connection and removal of electrical devices there is preferably an electrical distribution system linking the devices with a central microprocessor-based control system within the housing and which utilises a common power supply lead and a control lead which controls connection of the devices to the power supply lead by operation of switches local to the devices.

Thus, and in accordance with a fourth aspect of the present invention there is provided a credit-operated entertainment machine comprising a housing containing control equipment including a microprocessor-based control system, at least one display panel mountable on the housing, and electrical display devices co-operable with the panel to provide a display therewith,

characterised in that the devices are linked to the control system via a common power supply lead and a control lead which controls operative connection of the devices to the power supply lead by actuation of switches local to the devices.

With this arrangement the wiring between the devices and the control system can be minimised. Connection and removal of the devices can therefore be much facilitated.

The common power supply lead and control lead can also be used for connection of electrical equipment other than the display devices associated with the display panel - such as a coin mechanism or pay out mechanism, or user controls such as press buttons.

It is visualised that the invention will find particular application in the context of a fruit machine in which case the electrical display devices will comprise or include a random (or pseudo random) symbol selecting device such as a set of rotatable symbol-bearing reels or a video display device providing a simulation of such reels, or any other suitable device preferably visible through a window.

The panel is preferably a glass or plastics panel having regions of differing transparency formed for example by printing translucent or opaque material onto a transparent pane.

The electrical devices may comprise or include lamps, in the form of individual lamps or a light box containing a matrix of lamps, or any other suitable device for back-illustration of transparent or translucent regions.

The electrical devices may also include a supplementary

selection device such as a number-bearing reel or the like for use in connection with a supplementary game and this may also be visible through a window.

The machine may have more than one panel. In a particularly preferred embodiment there are two panels. There may be a lower front panel with a window through which the above mentioned symbol selecting device can be seen; and an upper front panel for playing a supplementary game and having a window through which the above mentioned supplementary selection device can be seen.

The machine may have user controls such as press buttons for use in initiating game play and for controlling usual functions such as "hold", "nudge", "gamble" and the like; and also other mechanisms such as a coin slot leading to a coin mechanism and a payout mechanism arranged to feed to an outlet opening.

Most preferably the machine is constructed as a modular fruit machine with a robust permanent (or semi-permanent) housing (which may be formed from metal), and one or more panel modules, the housing containing the main control system and credit handling equipment, and the module (or modules) comprising a supported panel and preferably also some or all of the said electrical display devices.

With this arrangement, the housing can be located at a permanent (or semi-permanent) site position and when required this can be converted to a new model by replacing the (or each) module on site and by changing the control system eg by replacement of one or more chips or storage modules providing programme information or data for the microprocessor. It is therefore only necessary to transport the panel modules, and not the entire housing and it is even possible to have a supply of modules on site so that the machine can be converted as and when required.

In this context it is most convenient if the reels (in the case where these are provided) are changeable with the modules since otherwise it may be necessary to change the symbol sequences on the reels *in situ* for example for changing printed reel bands fixed around the reels. In order to facilitate incorporation of the reels in the module, these are preferably of the "flat" kind having a reel band running around opposite spindles or the like to provide essentially two runs which may be straight and parallel, or one straight and one curved, as further described in our copending Application No. 9504441.8.

The invention will now be described further by way of example only and with reference to the accompanying drawings in which:-

Fig. 1 is an exploded diagrammatic perspective view of one form of a fruit machine according to the present invention;

Fig. 2 is a sectional view of lower module of the machine of Fig. 1;

Fig. 3 is a detail showing the mounting of an upper module of the machine;

Fig. 4 is a block circuit diagram of the machine.

Referring to Fig. 1, there is shown a fruit machine having a floor-standing box construction housing 1 which is robustly made from metal or wood or any other suitable material or combination of materials.

The housing has a bottom plinth 2 with a front access door 3 providing access to an internal cash box.

In the middle region there is a forwardly projecting table part 4 which provides support for a lower front panel module 5 yet to be described.

In its upper region the housing 1 has an open fronted part 6 across which is mounted an upper front panel module 7 yet to be described. Above this there is a coin slot 8 which connects with coin handling equipment within the housing. Also within the housing there is a microprocessor-based control system and a payout mechanism connected to a payout outlet (not shown).

The lower front module 5 comprises a screen printed glass panel 9 mounted within a framework 10 which may be of metal or plastics. As shown in Fig. 2 the framework has lower flanges 11 which slidably engage and interlock with metal supporting extrusions 12 of the table part 4 of the housing 1.

When locked in position the glass panel 9 faces upwardly. Also, an electronics plug 13 mates with an electronics socket 14 alongside one of the extrusions 12. When required the module 5 can be removed by release of the interlock by an authorised person (eg using a key).

Within the module 5 behind the glass panel 9 there is a light box 15 containing lamps and also three rotatable symbol-bearing reel assemblies 16 of the "flat" kind hereinbefore described. Along a front edge of the module 5 there are various user press buttons 17. The press buttons 17, reel assemblies 16 and lamps 15 are connected to the electronics plug 13. The glass panel 9 is screen-printed in the usual way to provide a window through which the reels 16 can be seen (three symbols on each behind a win line), and also to provide decoration and information regions arranged to be back illuminated by the lamps 15.

The upper front module 7 comprises a screen printed glass panel 18 mounted within a framework 19 of metal or plastics. As shown in Fig. 3 at its rear the framework 19 has rigid pegs 20 which engage slots 21 in a support plate 22 hinged to an upright edge of the housing 1.

The module 7 can be locked in position across the front of the housing with its glass panel 18 facing forwards. When required the module can be removed by an authorised person by releasing the lock and then hinging the module forwards so that it can be slid out of the slotted plate 22. The module 7 may have a separate lock or it may be retained in position by the locked lower modules.

Within the upper module 7 there may be a light box containing a matrix of lamps and also a "flat" number-bearing reel for use with a supplementary game involv-

ing back-illumination of successive printed regions. The upper module 7 has an electronics plug which mates with a socket in like manner to the lower module when the upper module is locked in position.

Referring now to Fig. 4, the control system comprises a microprocessor unit 23 to which is connected a plug-in programme card 24 containing control data specific to the particular game to be played with the machine. The unit 23 is connected via interfaces to various internal devices of the machine including the coin mechanism 25 and the payout mechanism 26.

Two main buses 27, 28 run from the unit to the upper and lower panel modules connected via the plugs and sockets 13, 14. These buses comprise a power supply bus 27, and a serial data bus 28. The buses are connected to the electrical devices in the modules via switches 29.

The microprocessor unit 23 controls operation of the electrical devices in accordance with the game determined by the card 24 and power is supplied to the lamps and reel assemblies as required by using the serial data bus to switch on interconnection between the power supply bus and the electrical devices.

The use of bus connections between the unit and the modules minimises the wiring and also establishes a standardised mode of interconnection. The lamps and reel assemblies are not purpose-wired to the unit. The modules are connected through the standardised plugs and sockets and appropriate control is effected by virtue of the instructions derived from the program card corresponding to the particular modules.

When it is required to change the game it is only necessary to remove the modules, replace these with new modules and put in a new program card. The main housing does not have to be changed. This has the advantage that it is only necessary to transport the modules which may be conveniently portable.

It is of course to be understood that the invention is not intended to be restricted to the details of the above embodiment.

For example, the modules may be of adjustable width or other dimensions so that they can be mounted on different sizes of compatible housings.

Although it is preferred that the modules should contain the lamps and reels, if desired some or all of these devices may be mounted in the housing so that they have to be modified or removed as necessary separately from the module. The press buttons also may be mounted on the housing rather than the module if desired.

Although the use of power and serial data buses to minimise wiring is described in relation to a modular fruit machine it may also be used in a purpose-built machine which may be any suitable kind of fruit machine or other entertainment machine.

Claims

1. A credit-operated entertainment machine system comprising a housing containing control equipment, at least one display panel mountable on the housing, and electrical display devices cooperable with the panel to provide a display therewith,
characterised by the provision of at least one further display panel (9) interchangeable with the first said panel (9), said panels being removably mountable on the housing (1) in said cooperation with said devices (15, 16).
2. A machine system according to claim 1 characterised in that at least one said electrical display device is mounted in the housing (1) so as to have a pre-determined interrelationship with the removably mounted panel.
3. A machine system according to claim 1 or 2 characterised in that at least one said electrical display device (15, 16) is mounted on the panel so as to be removable therewith.
4. A credit-operated entertainment machine comprising a housing containing control equipment, at least one display panel mountable on the housing, and electrical display devices cooperable with the panel to provide a display therewith,
characterised in that the panel (9) is removably mountable on the housing (1) and at least one electrical device (15, 16) is mounted relative to the panel so as to be removable therewith.
5. A machine system according to any one of claims 1 to 4 characterised in that at least one further electrical device (17) is mounted on the panel so as to be removable therewith.
6. A machine system according to claim 5 characterised in that the further electrical device is a user control (17).
7. A machine according to any one of claims 1 to 6 characterised in that the panel is supported on the housing by means of a frame structure (10) so that the panel (9) can be removed and mounted as a module together with this structure (10).
8. A credit-operated entertainment machine comprising a housing containing control equipment, at least one display panel mountable on the housing, and electrical display devices cooperable with the panel to provide a display therewith,
characterised in that the panel (9) is provided with a supporting structure (10) and the panel is removably mountable on the housing (1) as a module together with the frame structure (10).
9. A machine system according to claim 7 or 8 characterised in that the frame structure (10) is mountable on the housing (1) by a sliding connection (11, 12).
10. A machine system according to claim 7 or 8 characterised in that the frame structure (10) is mountable on the housing by a separable or lift-off hinge.
11. A machine system according to any one of claims 1 to 10 characterised in that there is provided an electrical distribution system linking the devices with a central microprocessor-based control system (23, 24) within the housing and which utilises a common power supply lead (27) and a control lead (28) which controls connection of the devices (15, 16) to the power supply lead by operation of switches (29) local to the devices.
12. A credit-operated entertainment machine comprising a housing containing control equipment including a microprocessor-based control system, at least one display panel mountable on the housing, and electrical display devices cooperable with the panel to provide a display therewith,
characterised in that the devices are linked to the control system (23, 24) via a common power supply lead (27) and a control lead (29) which controls operative connection of the devices (15, 16) to the power supply lead (28) by actuation of switches (29) local to the devices.
13. A machine system according to claim 11 or 12 characterised in that the common power supply lead (27) and control lead (28) are also used for connection of electrical equipment other than the display devices.
14. A machine system according to any one of claims 1 to 13 characterised in that the display devices comprise or include random (or pseudo random) symbol selecting devices (16) visible through a window.
15. A machine system according to claim 14 characterised in that the symbol selecting devices are actual or simulated rotatable symbol-bearing reels (16).
16. A machine system according to any one of claims 1 to 15 characterised in that the panel (9) has regions of differing transparency.
17. A machine system according to any one of claims 1 to 16 characterised in that the display devices comprise lamps (15) for back-illumination of transparent or translucent regions.
18. A machine system according to any one of claims

1 to 17 characterised in that the devices include a supplementary selection device visible through a window.

19. A machine system according to any one of claims 1 to 18 characterised in that the machine has separate upper and lower panels (9, 18). 5
20. A machine according to claim 15 characterised in that the reels (16) are of the kind having a reel band running around opposite spindles to give two opposed band runs. 10

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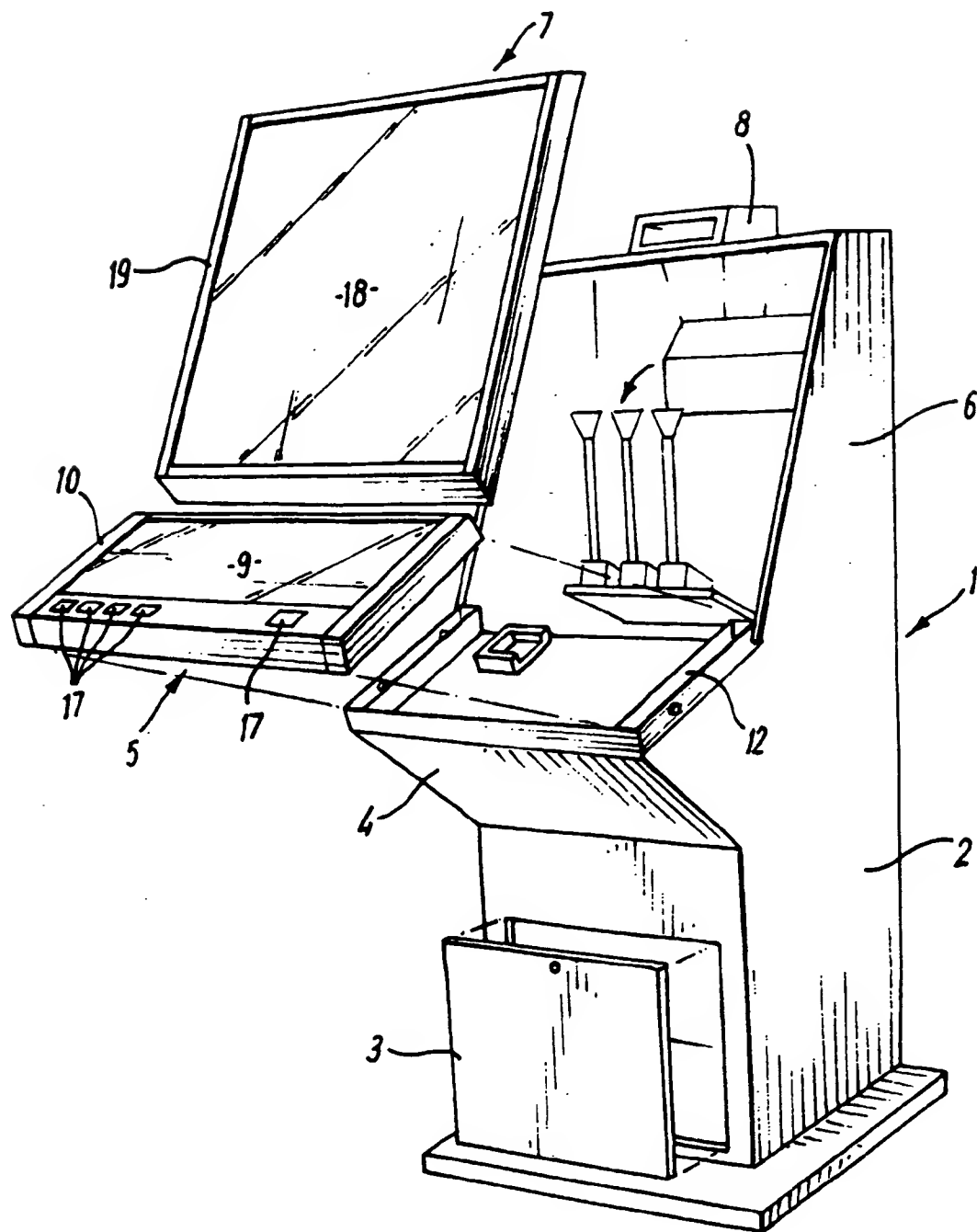


Fig. 1

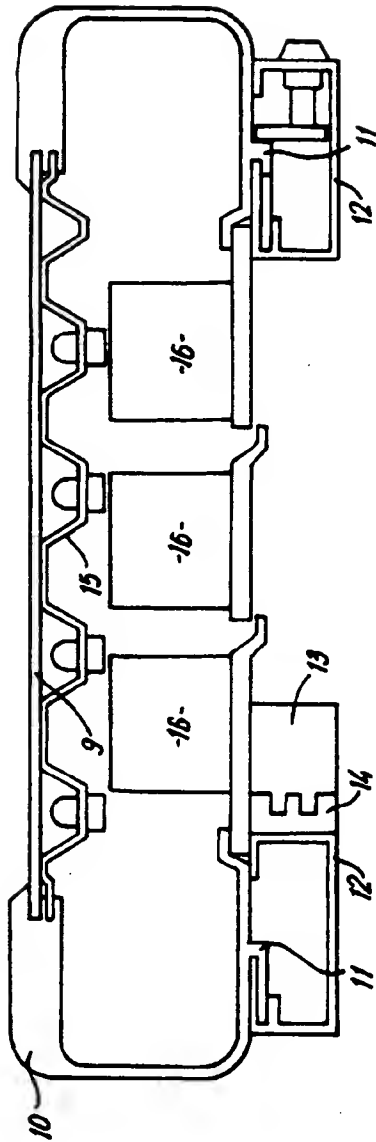


FIG. 2

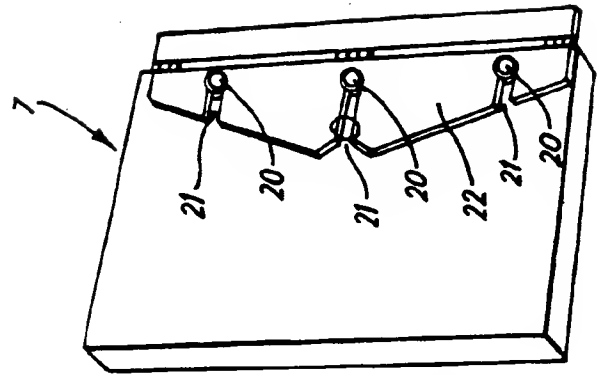


FIG. 3

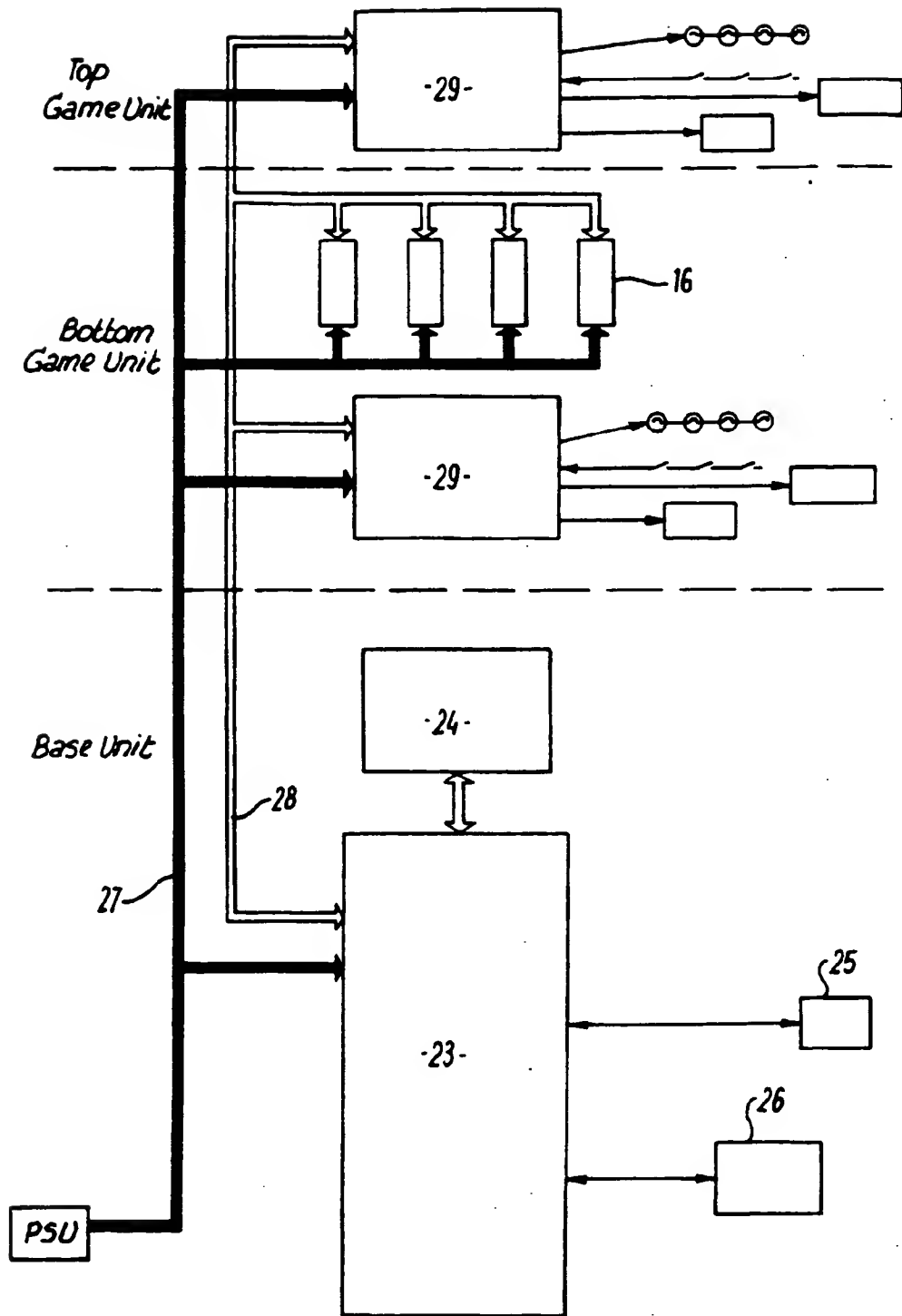


FIG. 4



(11) **EP 0 738 991 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
30.12.1998 Bulletin 1998/53

(51) Int Cl.⁶: **G07F 17/32**

(43) Date of publication A2: 23.10.1996 Bulletin 1996/43

(21) Application number: 96302643.0

(22) Date of filing: 16.04.1996

(84) Designated Contracting States:
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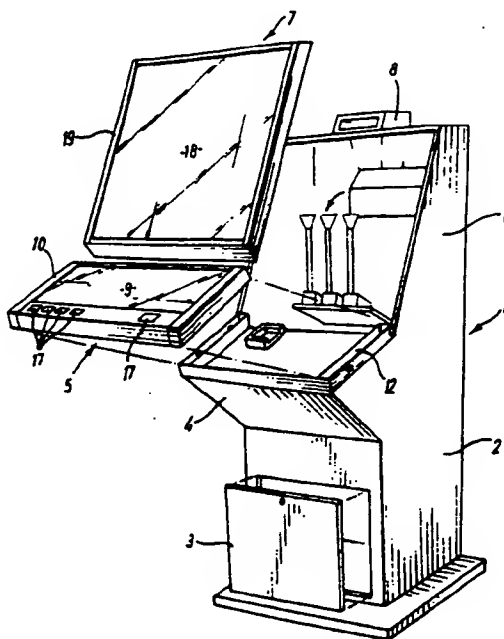
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**FIG. 1**

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EUROPEAN SEARCH REPORT

Application Number
EP 96 30 2643

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	DE 34 24 594 A (GAUSELMANN) 9 January 1986	1-10, 14-18	G07F17/32
Y	* page 6, last paragraph - page 7, line 23 *	20	
A	* page 9, line 1 - line 4; figures 1,2 *	11,12	
Y	GB 2 287 344 A (BARCREST) 13 September 1995 * abstract; figure 2 *	20	
X	GB 2 091 014 A (AMF ELECTRONICS) 21 July 1982	1-4,7,8, 11-19	
Y	* page 1, line 49 - line 56 *	5,6,20	
A	* page 1, line 101 - page 2, line 21 *	9,10	
	* page 2, line 38 - line 55 *		
	* page 2, line 112 - line 127; figures 1,2,5,6 *		
Y	AT 374 291 B (AUTOMATEN DATTL) 10 April 1984	5,6	
A	* page 3, line 28 - page 4, line 20; figures *	1,4,8-14	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
X	EP 0 316 175 A (BELL-FRUIT) 17 May 1989	1,3-9, 14-17	G07F
Y	* column 4, line 2 - line 42; figures *	5,6,20	
A		2,10-13	
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		4 November 1998	Neville, D
CATEGORY OF CITED DOCUMENTS			
<p>X : particularly relevant if taken alone</p> <p>Y : particularly relevant if combined with another document of the same category</p> <p>A : technological background</p> <p>O : non-written disclosure</p> <p>P : intermediate document</p> <p>T : theory or principle underlying the invention</p> <p>E : earlier patent document, but published on, or after the filing date</p> <p>D : document cited in the application</p> <p>L : document cited for other reasons</p> <p>& : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03 02 (Rev.02/1)